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IN THREE SECTIONS

## Section I

N.A.C.A. LIBRARY

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## EDITORIAL DEPARTMENT NOTE

The first paper in this issue of our Bulletin relates to a subject about which we have published very little. In several respects accounting for baking costs is rather simple. The unit of costing most commonly used is 100 pounds of baked product. The various baked products are made up of ingredients which are mixed according to definitely established formulas. Hence, most of the accounting detail is simple and easily gathered.

J. H. Middleton, the author of the first paper, received his academic accounting training from the La Salle Extension University in Chicago. Following his World War service at Kelly Field, Texas, he engaged in the practice of public accounting in Chicago for one and a half years. He then became associated with the W. E. Long Company of Chicago and was actively engaged for seven and a half years in the installation of general and cost accounting systems in bakeries in many parts of the United States. Six years ago he entered the executive offices of the Western Bakeries Corporation, Ltd., in Kansas City, Missouri. When his company opened a plant and offices in Los Angeles he was sent there to take complete charge of all accounting activities. At the present time he is Assistant Secretary and Treasurer of Western Bakeries Corporation, Ltd., and an officer of eight associated companies.

Mr. Middleton has been a member of our Association for about six years and is now serving as Director of Publications for the Los Angeles Chapter. This paper was delivered at the regular meeting of the Los Angeles Chapter in April, 1932.

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The second paper in this issue of our Bulletin relates to a subject about which much has been said, but until recently nothing much was done about it. The cost of handling orders as they come in from the salesmen, involving the expenses of carrying on the clerical, storing, filling, packing, shipping, and collection activities relating to customers' orders, is, in many cases, staggering in amount. In this paper the author explains how standard rates for these activities were established, and how they were applied in such a way as to distribute the total order handling and filling charges over the commodities sold by a large manufacturing company.

Frank J. Naumann, the author of this paper, is a graduate of the Wharton School of Finance and Commerce of the University of Pennsylvania. Following his graduation he became an instructor of Industry at the same University, which position he held for five years. During this period he also followed a course of graduate study in the fields of economics, statistics, industrial relations, and industrial management. In 1930 he entered the employ of the Dennison Manufacturing Company as accountant in charge of general and sales accounting. His paper is the result of work he has been doing for the past two years with this concern in the clerical branch of the field of distribution costs.

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JANUARY 15, 1933

## BAKING COSTS

**By J. H. Middleton, Assistant Secretary and Treasurer, Western Bakeries Corporation, Ltd., Los Angeles, Cal.**

DR. PAYNE the psychologist once said that we are either ashamed of our past or not proud of our present positions. He told the story about a young lady from the South who told every one up North that her father was a southern planter. She married and took her husband down South and her southern planter father turned out to be a grave digger. I figure that by such a stretch of imagination I am an accountant and as an accountant I feel that I have a problem if our bakeries are going to continue and that this problem is one of cost control.

Baking, as commonly known today, is one of the few industries that maintains a complete cycle of operations each day—that is, starting in with raw material in the morning and that same evening receiving the cash or its equivalent.

Baking, as generally understood, is the "Art and Industry of Preparing Appetizing and Healthful Food Products," using crushed or finely ground cereals as the principal materials, subjecting the same, suitably prepared, to baking in a hot oven. They tell us that the baking industry has been an easy one to enter. A little capital, some experience and you are on the road to prosperity. Maybe that was so when the profit margin, (that is, the difference between cost and selling price) was so great that it allowed for inefficiency. But today that profit margin is narrowing and we have to look to see where we can squeeze out the leaks and losses.

Success in the baking business today has proven itself to be dependent upon the efficient production and merchandising of quality goods, together with the maintenance of an adequate system of accounting and management.

As an accountant, I consider that our industry is most fortunate in the simplicity of the accounting detail required and in the ease with which we can gather accounting facts. We have an advantage in our industry in that we have a wonderful "Yard Stick" with which to measure and compare our facts—100 pounds of baked products. In my contact with accountants of other industries I feel they envy us. You can't do this in the garment industry,

you can just about do it with milk, you can do it somewhat with pulp, but you cannot do it with shoes.

Now, in gathering facts, in analyzing facts, in comparing facts, we are merely working with history. It has all happened, it is all over and all the collecting and analyzing and comparing will not control costs nor even reduce them.

You cannot control costs in the main stream. Our United States Army Engineers are going back to the tributaries and by means of reservoirs, lakes and dams, are accomplishing a flood control that they could not secure with dykes down below. I think about dykes when the general directors come into the office raving and ramping, saying, "Costs *have* to be reduced." That does not get them down. Possibly in Jewish Biblical history, walls were knocked down by shouting at them; but you cannot knock down costs by shouting at them. You must go back to your individual expense accounts where you have individuals accountable for the expenditures which affect the measure of control.

Production men have a big responsibility for material. Not only must we assure ourselves that the plant is getting, as far as weight is concerned, what the firm is paying for, but by practical baking tests we can check whether the firm is getting the quality and ingredients that it is paying for.

One of the first things in our plant is, of course, the control of material, and one of the most important factors of our costs is "Invisible Loss." This is merely the unaccounted-for material. Various things contribute to such loss: material, after purchase, may come into the plant without being properly checked; there may be a loss due to short-weight packages being received; there may be a loss during the storage period which depends largely upon storage conditions; then, there is a loss which comes from misappropriation. Storing of flour is one of our biggest problems here on the Coast. We endeavor at all times to keep the storage temperature around 70° to 75° and a rather high humidity, in order to keep the invisible loss down to the very minimum. Invisible loss itself during the storage period is nothing more or less than evaporation of moisture content in the flour. When flour leaves the mill a moisture content of from 10% to 11½% is included. If a loss as low as .6 of 1% is experienced, we consider ourselves lucky. We have found cases in our plants where invisible losses have reached

the point of from 4% to 5%. Invisible loss in our bakery is a very important one. If we sustain a loss of say, 5% on $20,000 worth of material stored in the bakery, we would have a loss of $1,000 during a period, which is, of course, a very substantial amount and is worthy of our serious consideration at all times.

We endeavor to maintain a very complete control of our raw material by taking weekly inventory; second, by keeping a detailed, itemized record of each kind of material that enters into the dough by checking daily production loaves against material. Inasmuch as each individual dough should be mixed according to a definite formula, the weight of the dough out of the mixer should agree closely with the total weight of the ingredients in the formula, provided that all of these ingredients are carefully weighed out. In order to weigh the dough directly after it is mixed, a floor scale is invariably provided. The trough in which the dough is to be placed is first weighed empty. The trough containing the dough is then weighed and the difference between these two weights represents the weight of the dough itself. If the net weight of the dough itself, directly after mixing, does not agree closely with the formula weight as recorded on the dough report, there are several factors which, of course, should be immediately checked in order to determine the reason for the loss. These factors are:

1. Careless removal of dough from mixer
2. Errors in weighing, recording, or absorption
3. Improper care of scales and weight.

In our business there is no advantage in having facts if they are not correct and there is no advantage in having our mixing men put down weights if they are not what is being mixed. The information is worse than useless; it is not information—it is misinformation.

We have considered briefly the matter of raw materials and the hazards that are incurred in connection with losses that may transpire. Our next stop, following the operations through the plant after the matter of invisible loss, is "evaporation loss," sometimes termed "fermentation loss." Carbon dioxide gas, which raises the dough, is produced, together with some alcohol, by the action of yeast on the sugar in the dough. Naturally, when the dough is

punched, this carbon dioxide gas and alcohol vapor is driven off into the atmosphere. This actually represents a corresponding loss in the weight of the sugar content of the dough. A certain slight fermentation loss of this nature, of course, is practically unavoidable in order that the dough may be properly risen and conditioned. This loss, however, normally, should not exceed .5 of 1% of the weight of the dough. This loss may be naturally higher in different types of dough, that is to say, a long-time fermentation dough compared to a so-called short-time dough which is folded over only once. Proper fermentation factors, which are most influential in reducing evaporation losses to a minimum are:

1. Proper control of temperature and humidity in the dough room
2. Reduction in the number of times the dough is punched, or folded over.

Now that we have our material already put through the mixer and the fermentation loss is sustained, we send the dough through the next step of operation, which is the "divider."

The "scaling weight" of each piece of dough is a predetermined factor and the dough divider is adjusted so that each individual piece of dough will have the desired weight. On an average each piece of dough, when delivered from the divider, should be about 10% heavier than that desired for the final baked product. There is a so-called bake-out loss in the oven and you may all know the smallest unit of bread allowed in the State of California is a 16-ounce loaf, weighing that 12 hours after it has left the oven.

There are quite a few controllable cost factors entering into the actual production, such as damaged bread, direct labor, shop expense, miscellaneous shop help, dusting flour per 100 pounds of dough, pan or trough grease per 100 pounds of dough, oven fuel steam fuel, loss or gain in scaling and average employee's production per hour.

Stale bread is another one of our most expensive costs of doing business. It is rather difficult to define staleness fully in a few words. From the standpoint of the consumer, bread is considered stale when measured by the sense of feeling and taste, by contact with the crust, and by color. It appears dry, harsh and not acceptable as fresh. There are, of course, various degrees of staleness. There exists no absolutely definite dividing line between so-

called freshness and staleness of a loaf. In general, however, bread which is termed fresh, possesses a crumb which is somewhat elastic and springs while the crumb of stale bread is more opaque and, at first, tough; then later crumbly or hard, with a noticeable lack of flavor.

Most people are naturally inclined to believe that "staleing" is due entirely to moisture drying out of the loaf merely because stale bread becomes harder and apparently drier. A study of this problem indicates that the mere loss of moisture is not the sole factor in causing staleness, inasmuch as the loaf which has become stale can be brought back to a state of temporary freshness by reheating for a few moments in the oven.

I am sure that you will be very much interested in what we do with our stale bread. Well, to be frank about it, our "stales" are very low, averaging .5 of 1% to a 2% maximum. We have two avenues through which we dispose of stale bread, one being our own retail store, which is nothing more or less than a hole in the wall; and if any stale bread is left over one day after it is received in the store, it is then given to one of the local charitable organizations.

At this time, I will not go further into the matter of the internal operations of a bakery, as I am no authority whatsoever on the subject; primarily, what I believe you are all interested in is the proper recording of the transactions as they transpire and also what the ultimate disposition of those items is, followed by what is done after the accumulation and assimilation of the information has been made through our accounting department.

In our business there are 13 plants, located in Southern California. All accounting and financial statements are made at the main office. The accounting proper is maintained in two complete sets of books with 18 operating divisions. We maintain, in our general ledger, a so-called Spread Sheet which is a long sheet with the name of each individual plant in a particular column. We have the customary balance sheet set-up of assets, liabilities, capital and surplus, followed by the control sheets of the operating statistics. Subsidiary records of operations are kept and the control or total of each of the particular plants' net results are then transferred to the general ledger.

To give you a brief outline of how the subsidiary ledgers ap-

pear, I will at this time, discuss a few of these ledgers so that you can follow briefly our method. (See Charts 1 and 2.) There are seven lines for each particular period's operations. A period in our business consists of four weeks—13 months in our year and I will say at this time, gentlemen, that it is the most accurate way of setting up your accounting records. Your comparisons are equitable which, of course, is one of the prime requisites of present-day business. There are plenty of advantages other than this that might be mentioned, but I will not take the time to do so.

Again referring to the operating ledger which we term the expense ledger proper, the first item you will observe is the inventory. That inventory represents the values that were on hand at the end of the previous period. To that, or directly below that, is "Voucher." We maintain a voucher system for each specific plant. A "recap" of the individual classification of expense items entered into the voucher record is made at the end of each period and then spread over this operating ledger. We do the same thing also with payrolls, petty cash and journals. We add these six items up and we get a total which is, of course, our first predetermined factor. Instead of determining our expense as the next factor, we enter below that the inventory for the opening of the following period. The difference then between that inventory and the total, two lines above, represents the expense for that given period. All of our work in its entirety, irrespective of the source from which it comes, is prepared in recap form. The recaps are then transferred to this particular operating ledger for consolidating purposes and then transferred onto a statement of manufacturing and selling costs. From that point on, we figure our various costs, converting the money value only on this particular statement to a cost per 100 pounds of baked bread, also showing percentages.

There are two bases of percentage which we use. All costs entering into the actual production of a loaf of bread, consisting of materials, wrapping supplies, manufacturing labor, indirect manufacturing costs, cripples and fixed charges, are figured on the basis of the market value of every loaf of bread produced. From that point on, which includes the plant office expense, administrative costs, selling costs, shipping costs, delivery and advertising, we base our percentages on net sales rather than on production value. There is a line of demarcation in our set-up which we believe is abso-

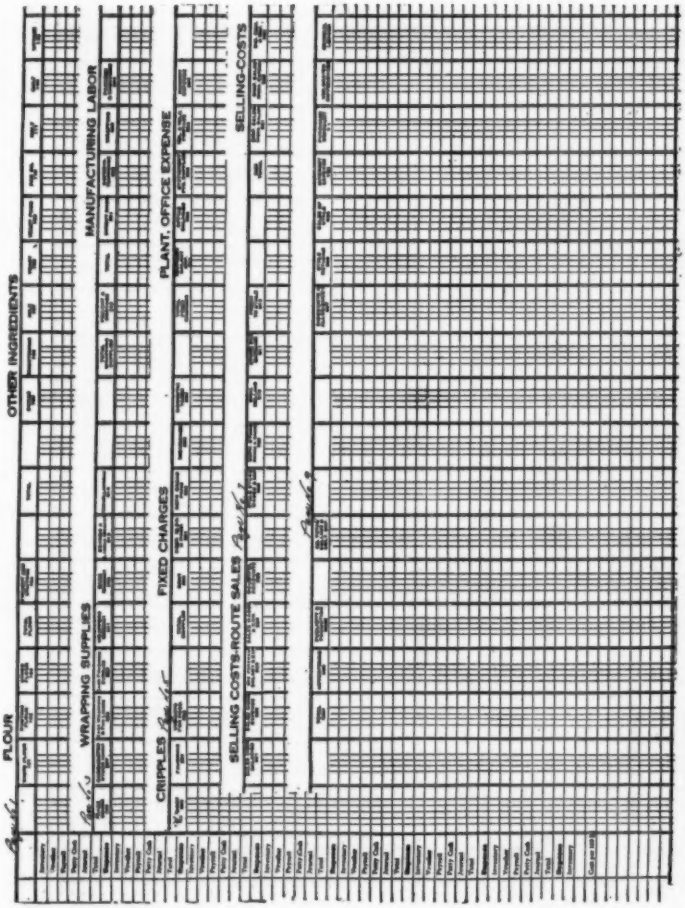
FLOUR
OTHER INGREDIENTS
WRAPPING SUPPLIES
MANUFACTURING LABOR
CRIPPLES
FIXED CHARGES
PLANT OFFICE EXPENSE
SELLING COSTS-ROUTE SALES
SELLING COSTS

CHART 1

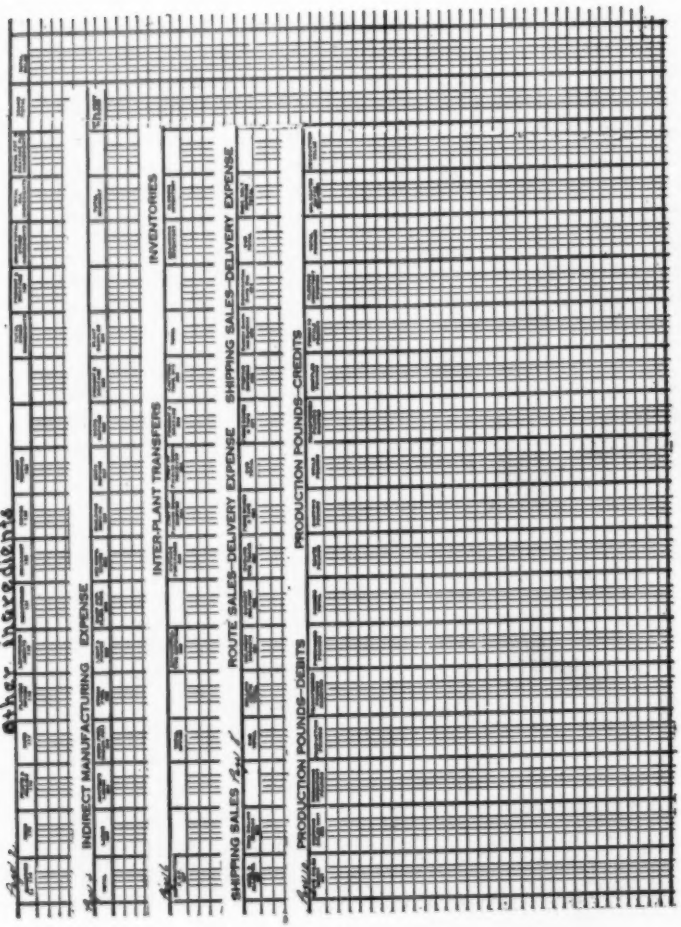
other ingredients
INDIRECT MANUFACTURING EXPENSE
INTER-PLANT TRANSFERS
INVENTORIES
ROUTE SALES-DELIVERY EXPENSE
SHIPPING SALES-DELIVERY EXPENSE
SHIPPING SALES
PRODUCTION POUNDS—DEBITS
PRODUCTION POUNDS—CREDITS

CHART 2

lutely true in all lines of business. First, the cost of a given article should be determined upon what it actually costs to produce that item; second, we must determine the "cost to the door," as we shall term it.

There is quite a difference between the two points in our busines in that there are so many losses that must be taken into consideration. In our case, one of the previously mentioned losses is stale bread.

A statement of manufacturing and selling costs, and an income and expense statement are prepared for each plant. We then take the statements of each plant, consolidate them into one operating statement, which brings us, of course, to the point indicating the net results that is reflected on our books, both by plants individually and collectively. We also prepare, in comparative form, a statement of costs based on 100 pounds of baked bread.

This is one of our most important forms for the reason that it immediately detects those plants which are out of line on a comparative basis. Here the human element enters into it in that the manager of a specific plant certainly does not want to see his plant with a red ring around a specific cost and the managers are all working in the direction of keeping their costs within the so-called standard which has been set by our office.

As our operating ledgers are closed—that is to say, all entries have been made therein, footed and balanced—they are immediately transferred in total to the general ledger. I am a firm believer in having the general ledger contain nothing but control accounts and the maintenance of subsidiary records covering the analysis of the important accounts. We, in our industry, maintain daily comparisons of costs of manufacturing the products, by necessity if you please, due to the previously mentioned complete cycle of operations. One of our most salient cost control reports is our Daily Report of Production and Sales, or our so-called "Shop Report." (See Chart 3.)

I will give you a brief outline of what we believe to be an ideal shop report. Basically speaking, the daily report of production and sales indicates the most important controllable factors, which are considerably condensed, primarily for convenience. After the production for a given day is completed, our plant offices begin to assimilate the necessary information for this report. When it is com-

**DAILY REPORT**

**PRODUCTION AND SALES** PLANT.

WEEK ENDING

| | Unit Value | MON. | TUES. | WED. | THURS. | FRI. | SAT. | TOTAL |
|---|---|---|---|---|---|---|---|---|
| LBS. WATER PER DOUGH SHEET | | | | | | | | |
| LBS. FLOUR PER DOUGH SHEET | | | | | | | | |
| LBS. OTHER INGREDIENTS | | | | | | | | |
| Total lbs. " to Mixer Dough Sheet | | | | | | | | |
| FERMENTATION LOSS | % | | | | | | | |
| LBS. DOUGH | | | | | | | | |
| LBS. PRODUCTION—BAKED BREAD | | | | | | | | |
| LOSS or GAIN—SCALING | % | | | | | | | |
| LBS. DUSTING FLOUR | CWT. | | | | | | | |
| LBS. GREASING | CWT. | | | | | | | |
| ABSORPTION—FORMULA | % | | | | | | | |
| ABSORPTION—ACTUAL | % | | | | | | | |
| % HAND MADE | % | | | | | | | |
| PROD. PER MAN HR.—DIRECT | # | | | | | | | |
| " " —INDIRECT | # | | | | | | | |
| " " —WRAPPERS | # | | | | | | | |
| " " —SHIPPING | # | | | | | | | |
| LBS. WASED PAPER—CWT. SALES | # | | | | | | | |
| LBS. AND VALUE WASTE PAPER | # | | | | | | | |
| PRODUCTION VALUE | | | | | | | | |
| GOODS FURNISHED | | | | | | | | |
| GOODS RECEIVED OTHER PLANT | | | | | | | | |
| GOODS TRANSFERRED TO " | | | | | | | | |
| DIFF. FINISHED GOODS INV. | | | | | | | | |
| TOTAL TO ACCOUNT FOR | | | | | | | | |
| NET SALES | | | | | | | | |
| DIFFERENCE | | | | | | | | |
| CRIPPLES—CHOP | | | | | | | | |
| " —CURRY | | | | | | | | |
| " —SHIPPING and WRAPPING | | | | | | | | |
| TOTAL CRIPPLES | | | | | | | | |
| STALE—DOUTES | | | | | | | | |
| " —SHIPPING | | | | | | | | |
| " —PLANT | | | | | | | | |
| | | | | | | | | |
| " —TOTAL | | | | | | | | |
| | | | | | | | | |
| ACCOUNTED FOR DIFF. | | | | | | | | |
| UNACCOUNTED FOR DIFF. | | | | | | | | |
| STALE SALES | | | | | | | | |
| | | | | | | | | |

| M | | INVISIBLE LOSS | FLOUR | OTHER | LBS. | REMARKS: |
|---|---|---|---|---|---|---|
| | 1 | INVENTORY BEGINNING | LBS. | LBS | LBS. | |
| | 2 | PLUS RECEIPTS | | | LBS. | |
| | 3 | TOTAL | | | LBS. | |
| | 4 | LESS TRANSFERS | | | LBS. | |
| | 5 | | | | LBS. | |
| | 6 | INVENTORY AT END | | | LBS. | |
| | 7 | USED PER INVENTORY | | | LBS. | |
| | 8 | USED PER DOUGH SHEETS | | | LBS. | |
| | 9 | LOSS | | | LBS. | |
| | 10 | FLOUR #8 - #7 | | | % | |
| | 11 | OTHER | #8+#7 | | % | |

CHART 3

pleted it gives the plant manager a concise picture of the day's happenings. This report, likewise, you will observe, is a recap form, which is a great deal handier for the manager in that he has comparisons from day to day. At the end of the week he has results for his given plant for that week and knows pretty well that if certain of these controllable costs are in line, based upon our standard, there will be no complaint. The first 17 or 18 items on the report gives the manager certain factors which are some of the prime necessities of our business. After that, it shows the disposition of the product after manufacture.

There are a great number of different reports and forms that we use in our business, covering practically every conceivable step of operation—starting in with the purchase of the material itself and following it clear on through to its ultimate disposition, which I will not at this time attempt to discuss.

We do, however, keep some mighty interesting statements of cost records which have proven valuable to us over a period of three to five years by giving us the most concise information with the least possible delay.

We have approximately three million of fixed assets in our plants and to maintain a record of those assets would appear to the average person to be quite a vast duty. Every single piece of equipment, irrespective of the kind or cost, has a separate and distinct card, indicating its cost, with the depreciation write-off against that particular item being noted on the reverse side of the card. (See Charts 4 and 5.) This, in itself, keeps us fully advised of the book value of anything in our plants at a moment's notice. Our cards are segregated according to our classification of accounts and by plants and I know that you all can see the advantages that can be obtained from the upkeep of a record of this type. The cards themselves are balanced each period, both as to value and also as to the cumulative depreciation, and at no time is our subsidiary record permitted to be out of balance with the general ledger. As soon as a new asset is purchased our fixed asset clerk immediately prepares a card, giving us the entire information and description of the machine. A brass tag number is affixed to the particular piece of equipment and then the card, of course, is filed along with the other cards. An identification tag is placed on every piece of equipment, about the size of a silver dollar. We may say

| FORM 601 REV. 5/30 | ENGINE NO. | SERIAL NO. | | TAG NO. | CHASSIS NO. | BODY NO. |
|---|---|---|---|---|---|---|

Description

Fixed Asset Acct.

Plant

DEPRECIATION RATE — YEAR | PERIOD

Authorization #

Bought of  Vo. No.  Period Ending  Manufact's No.

Date Bought  Our Order No.

| | AMOUNT | REF. | CHANGES IN BOOK VALUE | AMOUNT |
|---|---|---|---|---|
| Cost | | | | |
| Extras | | | | |
| Freight and Cartage | | | | |
| | | | | |
| Install P. O. # | | | | |
| | | | | |
| Disposal Date  To | | | Scrap Value | |
| | | | Received | |
| | | | | |

CHART 4

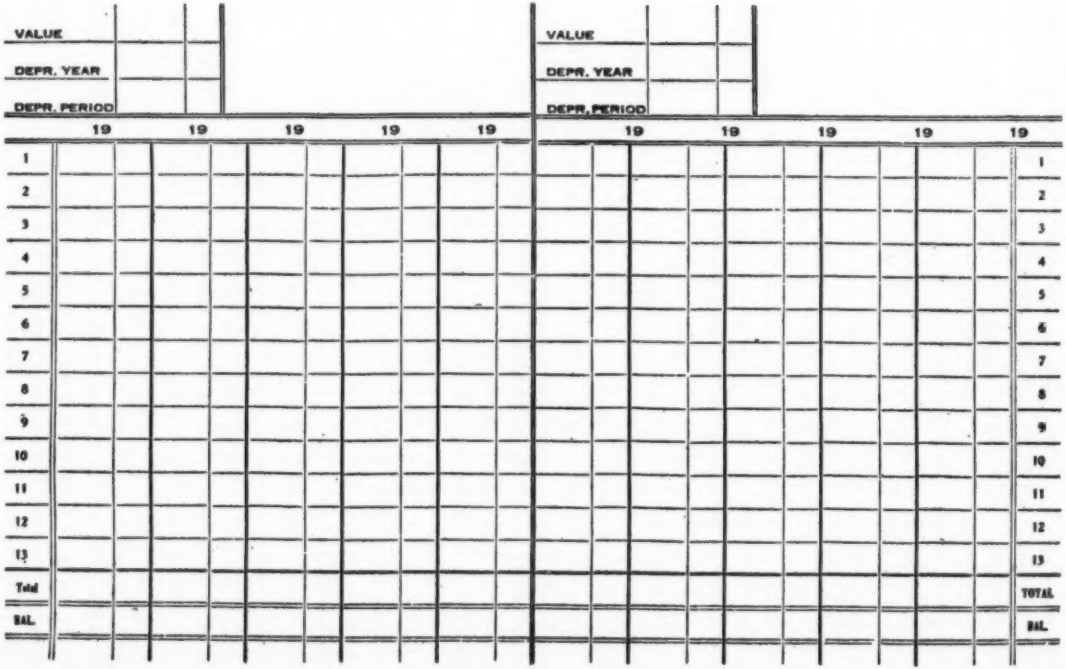


CHART 5 (REVERSE OF CHART 4)

that a motor for a given plant is purchased today and delivered. The first thing our plant does is to apply a brass tag number and that number is immediately placed or noted on the invoice itself. As soon as the invoice reaches our office we, of course, transfer the information, together with the brass tag number, and that motor forthwith will be known by its brass tag number instead of "Motor of John Jones Company, serial number, etc." Our delivery equipment as soon as purchased is assigned a chassis number, with a separate and distinct number being applied to the body itself. The reason for that is that a chassis in our business has a useful life from 3½ to 4 years and the body from 7 to 10 years. In the sale or disposition of any asset, irrespective of the kind, we immediately know at the end of any given period the exact book value of it. Where there is a great deal of transferring or sales, or discarding of machinery, it facilitates the matter considerably to maintain a record of detail of this kind which is vitally necessary in accurate accounting.

We maintain one of the most complete records of truck cost acounting that it is possible to maintain, giving us the necessary information as to the maintenance cost of the cars for any given period, as well as the cumulative cost of any particular piece of equipment from the date of purchase up to the present time.

I am submitting a copy of the final recap form itself which I believe you may all be interested in. (See Chart 6.) Briefly explaining the form, we keep a detailed record of these in subsidiary form on what specific costs are involved on each chassis during the period and then recapped onto one of these particular forms. The columns lettered from A to P are for the current period, together with columns R and S. Beginning with column T, the cumulative costs and cumulative miles represent the entire mileage and costs from the date of the purchase of the car itself.

In maintaining a record of this type it is very simple indeed by reason of the fact that we have but five forms necessary to complete the entire recording transaction, giving information to be used upon the period costs as well as the entire cost since the date of purchase. These constitute a very valuable record, showing constantly the condition of the cars, the cost of the cars and what sort of mileage is being obtained through proper control and maintenance of the equipment in A-1 mechanical condition, in addition

DATA

UNIT BOUGHT_____ COST: CHASSIS _____

NAME_____ BODY_____

CAPACITY_____ OWN LABOR _____

MOTOR NUMBER_____ COST_____

| | YEAR | | | | | | |
|---|---|---|---|---|---|---|---|
| | COST | | | | | | |
| | DEPRN. | | | | | | |
| | NET VALUE | | | | | | |

A 6

PERIOD ENDING_____

PLANT_____

TRUCK NO ___ ___ ___ ___

| PERIOD ENDING | REPAIR PARTS | REPAIR LABOR | GARAGE BURDEN | TIRES & TUBES | Misc. Items Charge | GAS | OIL | DIRECT CHARGES | TOTAL OPERATION | DEPRECIATION | OTHER FIXED CHARGES | TOTAL COST | MILES RUN | CUM MILES | CUM WEEKS | CUM COST | RECOVERY REPAIRS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | J | N | O | P | Q | R | S | T | K |
| 1 | | | | | | | | | | | | | | | | | |
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| 30 | | | | | | | | | | | | | | | | | |
| 31 | | | | | | | | | | | | | | | | | |
| Total | | | | | | | | | | | | | | | | | |

CHART 6

to keeping us fully advised of cost per mile on different size and types of trucks owned.

I will not attempt to go into great detail on this matter; however, if any of you readers are interested in what we believe a proper truck accounting system, I will be more than glad to go into full details. Our truck accounting is not an experiment, as it has been used in our system for a period of five years. When we first began the system it was, of course, very much more elaborate as to size, and it gradually dwindled down to a standard size sheet of 8½ x 11 inches, which is another valuable feature in compiling and condensing the information, filing, etc.

Now that I have brought my story somewhat down to the point of the determination of profits, there is just one other element that enters into our accounting system, and that is to ascertain where the profits proper were obtained. Briefly, each of our plants has a given number of routes supplying specific territories or customers. We know the pounds hauled during a given week and we recap all of this information onto a periodical statement and apply all costs to this statement which we term a "Route Profit and Loss Statement." (See Chart 7.) Referring to this statement, you will observe that we have columns provided for truck numbers, route numbers and pounds sold. The load value is a determined factor, being the amount or value of the load which was taken out during a given period. Against that we deduct the stale returns and then obtain the percentage of the stale returns to the total loaf value, followed by that of net sales. We apply against each individual route the given cost as evidenced from the information and data contained on the operating statement on a percentage basis which is about the fairest way, we believe. Certain information is predetermined, that is to say, we know what each individual route salesman's wages amount to and we also know what that specific cost of operating the trucks represents in a given period. The application of other information follows in sequence, more or less, on a basis of percentage and when the statement is finally completed in its entirety it shows, at a glance, to the management, what routes are the most profitable ones and which are the unprofitable ones.

The entire system utilized is one based principally upon direct entry to the general ledger, subsidiary and analytical statements

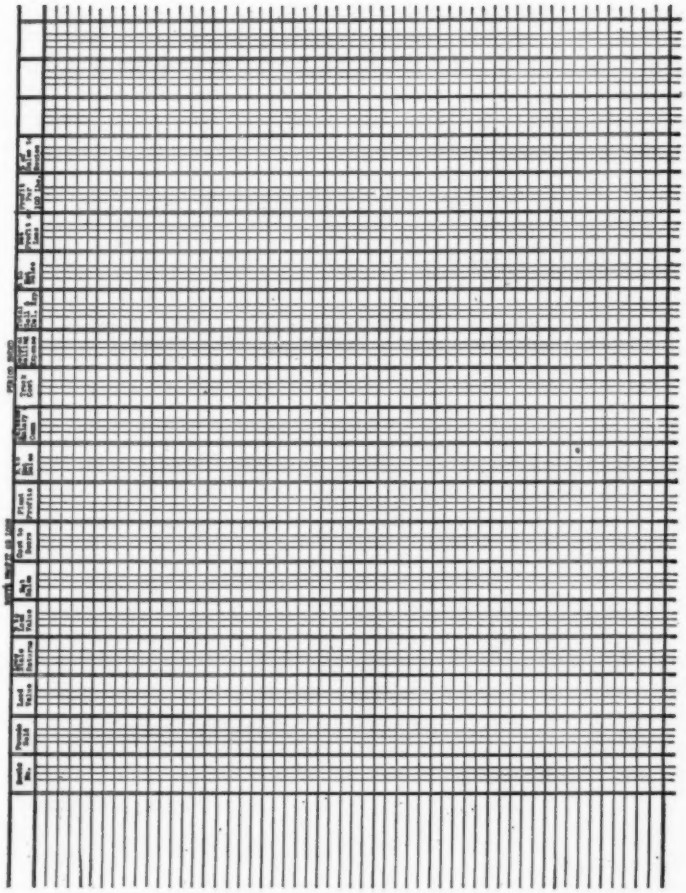

CHART 7

necessary to substantiate the entry proper. As far as I can possibly determine, there are but four points on effective cost control: cost accounting simplicity; prompt, accurate recording; intensive analysis; and comprehensive comparison.

Then, with action, executives are going to get some real cost control, coupled with the fact that we must educate not only the head and hand but the spirit of the man who controls the head and hand, for a man's actions are finally and irrevocably dictated by the things he thinks about.

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# THE DEVELOPMENT OF STANDARD ORDER-HANDLING AND ORDER-FILLING COST RATES

By Frank J. Naumann, Accountant,
Dennison Manufacturing Company

AS WITH many concerns in America which found themselves soon after the War face to face with the wholly new phenomenon of a buyer's market, the Dennison Manufacturing Company has come to realize clearly that to manufacture goods efficiently is one thing and to sell them at a price which will return a profit is quite a different one. In fact, for more than ten years members of its accounting and budgetary staff have become more and more interested in the subject of costs beyond the factory gates. And more particularly, they have during this time even attempted to introduce into the broad field of merchandising efforts, some semblance of control and understanding of its processes that has been attained in the realm of production costs.

Those of us associated with the Dennison Manufacturing Company, and especially those of us who have worked at the problem would certainly like to be able to say that this point has been achieved. Unfortunately no such claim can possibly be made. Although we have proceeded a little farther afield in the maze of marketing costs perhaps than the average concern, not too many tangible results have been attained. We are still only a short distance beyond the stage of what might be called "concept-development" in the great void of order-getting or selling costs. We have hardly begun to scratch the surface of the costs associated with the delivery and transportation functions. When it comes to the field of advertising or demand creation costs—well, we must be satisfied with saying that we are merely approaching the point of considering them.

*Secondary or Order-Handling Costs*

These are not particularly pleasant facts for us to inform you about or for ourselves to face. Nevertheless, we feel confident that our efforts have not been entirely wasted. We have at least clarified our own thinking in the direction of marketing costs, and have come to recognize some of the errors which were made in our

approach to the problem so far. This counts for something. But most significant of all, our apparently aimless wanderings have led us to what begins to look like a really worth while accomplishment in one field of distribution costs—a field which in the Dennison organization has commonly come to be known as "Secondary Costs," and elsewhere as "Order-Handling Costs."

Not only have we learned a great deal about these costs—costs which arise out of the clerical, warehousing, filling, packing, shipping, and money-collecting activities—but in the past few years have developed standard rates with which to charge this group of expenses to the various merchandise lines. Recently, too, an accounting technique, similar to that used for our factory costs, was developed to record these so-called "Secondary Costs" on the Company's books. This is now in operation.

Both of these developments are proceeding to give us concrete data with which to measure more fully the profitableness of our individual items. They are commencing to furnish us with the bases on which to formulate intelligent merchandising policies. They are also beginning to point the way to an effective control over the expenses incurred in handling and filling orders by providing the necessary measuring sticks with which to gauge efficient performance.

*The Place of Order-Handling Costs*

It is well to point out in conjunction with this that the value of a real maintenance of control over this field of merchandising costs is not to be rated lightly. After all, the expenses of carrying on the clerical, warehousing and shipping processes which precede or follow the manufacturing operations rise up in total to a surprisingly large figure, and bear close watching. In our own case, we were somewhat appalled when we first came to learn that they amounted approximately to $1,350,000 compared with a cost for factory operations of some $8,500,000 and average yearly sales of some $17,000,000. And our astonishment only increased when we started to investigate the handling costs on specific types of orders, and proceeded to learn of the really large number of instances in which they were choking off all profit. It is safe to say that this condition presents itself in all concerns which attempt to carry several thousand items of merchandise, manufacture a mul-

titude of specialties, cater to a wide variety of trades, and have a predominance of very small orders. When it does, it is quite easy to understand how these costs can wipe out earnings, and if left unchecked spell economic disaster for businesses with efficiently operating factories and aggressive sales organizations.

It is with the intention of telling you exactly how the Dennison Manufacturing Company went about its order-handling cost problem that this paper is presented. In doing so, the method which was employed in developing our standard secondary cost rates will first be described, the use to which they are put will then be considered, and finally the technique which we employ to record order-handling cost information will be explained.

## I. THE DEVELOPMENT OF STANDARD ORDER-HANDLING COST RATES

Practically all of the servicing functions on customers' orders in the Dennison Manufacturing Company are performed in the general office, the warehouse, and the planning divisions of the organization. In developing the series of standard rates used in charging order-handling and order-filling expenses to the various merchandise lines, most of the investigational work, therefore, had to be done in these units. Stated briefly, the procedure consisted: first of setting up budgets covering the normal operating expenses of these sections; second, of analyzing thoroughly the activities of their several subdivisions in order to determine the portion of their total expense which was of a true order-handling and filling nature; and third, of selecting the most logical bases on which this cost could be distributed and expressed ultimately in terms of standard units of expense.

### *Budgeting Normal Order-Handling Expenses*

The task of determining budgets which would represent the normal cost of performing order-handling functions by the warehouse, office, and planning divisions of the Company was not the least important phase of the work. Rather, it was one of the most fundamental, the adequacy of the final rates being predicated on the inclusion in them of the entire cost of handling and filling orders that would hold for the amount and type of business received. Consequently, much time and thought had to be given to it. It called

for a complete analysis of movements in the volume of our sales, in the size and character of our customers' orders, and in the expenses of performing the servicing functions on them over the last five or six years. It also involved attempts to project these trends into the future and especially to forecast changes that might occur in all of them in the next year or two. And in doing the latter, the judgment and experience of our merchandising organization, which keeps in close touch with these movements, was relied upon to a very great extent.

The budget which was developed and finally adopted, therefore, was one that ostensibly included the normal expenses of carrying on the clerical, storing, filling, packing, shipping, and money-collecting activities on customers' orders secured and turned over to the factory by the field selling organization. It was the one used in distributing these costs and in determining the final secondary cost rates.

*Bases for the Distribution of Normal Order-Handling Costs*

No less important than the building up of a proper budget was the selection of a series of logical bases on which to allocate these order-handling and order-filling expenses to the several merchandise groups. This required careful thought and consideration, because the degree to which the final rates would represent true line costs was recognized as being dependent on how accurately and sharply these costs could be segregated. Hence each of the several bases selected for this purpose was adopted only after a minute survey of the functions performed by the various order-servicing units and a close scrutiny of the fundamental influences affecting the volume of their work.

The cost factors that were finally selected for this purpose were seven in number, namely:

1. The invoice or customer's order. This basis has to do with the order or individual sale of merchandise to the customer. It is concerned with the invoice as a unit or separate entity apart from the items which appear on it. For purposes of distribution, it is used only for the expenses of performing those operations where the amount of effort expended and cost incurred is much the same for one order as another, regardless of the dollar value or the type and number of pieces of merchandise called for by it.

Some of these functions include the registering of orders received, passing the orders for credit, heading the sales invoice, posting to the accounts receivable records, filing the orders, and mailing the invoices to customers.

2. The stock or merchandise item. The stock or merchandise item is concerned with the individual unit of merchandise called for by the order, and is used for that group of expenses incurred as a result of operations in which the invoice is gone over item by item. Included among them are the costs of typing each line on an invoice, deducting withdrawals of stock from the inventory records, taking the merchandise from the bins, and assembling, checking, and packaging the goods for shipment.

3. The customer-month. This basic cost unit has to do with the expenses incurred as a result of operations which take place after one or more orders have been combined into an account. Included among them are the costs of maintaining the accounts receivable records, receiving and entering payments, preparing and sending out monthly statements, and otherwise handling customer charges and credits. The unit itself is measured in terms of the number of statements written in the course of a year or portion thereof.

4. The unit or package. The unit or package basis is concerned with the package, carton, container, or case in which the various items of the Dennison line are handled, stored, or shipped. It is used in connection with the expenses arising out of the physical handling of the goods in both the warehouse and shipping departments. Statistics which are gathered currently of the quantities forwarded to customers by freight, parcel post and express delivery make it possible to ascertain accurately the total number of packages handled by the various warehousing units, and thereby establish a cost per piece for different classes of merchandise.

5. The cubic inch. This unit expresses in terms of volume the consumption of space as an item of expense. It is employed largely in connection with the warehousing group of activities, and is used to distribute and express in the form of a standard unit the costs incurred for storage space occupied, for packing material consumed, and for some of the physical handling associated with the movement of merchandise into and out of the warehouse departments.

6. The dollar of total expense. This sixth and last cost factor, which was selected for the purpose of allocation and distribution, is concerned with the amount of order-handling and filling expense borne by the various office, planning, and warehousing divisions. It is employed only in the distribution of such general overhead or service expenses as general office administration, intermural messenger service and compensation insurance, none of which can justifiably be charged to the commodity lines or individual order-handling functions on any such specific basis as the item or the order. In a sense it is the least satisfactory of any of the cost factors that are employed. Under the circumstances, however, it appears to be about the most equitable one to use for the purpose of redistributing this class of expense.

### *The Distribution of Secondary Expenses and the Formulation of Standard Cost Rates*

Having determined the total amount of order-handling and order-filling expense that should enter the rates, and having selected the several bases on which to distribute it, the third and last requirement was to proceed about the work of distributing the expenses and developing the standard secondary cost rates. This involved the preparation and building up of numerous expense schedules. In formulating them, the various elements of secondary cost were reviewed. Each office, planning, and warehousing unit was surveyed, and a detailed analysis made of their separate functions. Time slips were examined, production records studied, monthly expense reports compared, and job studies reviewed—all this being done with the purpose in mind of determining as accurately as possible the precise basis on which each element of each expense is incurred, and each effort expended. In every case final decision concerning the proper basis to be used and allocation to be made resolved itself into answering satisfactorily the question as to which factor was the chief cause for any specific cost to vary or the volume of a particular type of work to fluctuate.

A detailed explanation of the distributions made would involve a greater expenditure of time than can possibly be given to it here. No more than the briefest sketch of the procedure can, therefore, be presented. Stated in rather simple fashion it con-

sisted of allocating each expense item on the basis of the cost factor or factors that were found to be most applicable; of apportioning the total thus distributed to stock or special merchandise, depending on the extent to which the cost was incurred for one or the other of these two broad classes of merchandise; of redistributing the total to the various commodity classes in order to obtain the total normal cost of handling and filling each distinct class of invoices; and finally of converting the total expense per merchandise line into three merchandise cost rates, namely, a standard item cost, a standard unit cost, and a standard cubic inch cost.

The entire process is illustrated quite well by the distribution which actually was made of the clerical expenses incurred in operating the Order Register Unit of the General Office Section. The analysis of the functions performed by this division indicated quite clearly that the order basis was the proper one to use for purposes of allocation, due to the fact that the amount of effort expended and the cost incurred by this unit is the same for one order as for another, regardless of the dollar value of the invoice or the number of items appearing on it. The total expense, amounting to some $35,000, was distributed, therefore, on this basis. In doing so, however, two-thirds, or $23,400, was applied to the stock orders and only one-third, or $11,600, to the special orders, on the grounds that twice as many stock orders are received during the course of a year as special orders. Considering only the former for purposes of simplification, the total expense of registering stock orders then had to be divided equitably between the various merchandise lines, of which there are five important ones: viz., box, crepe, holiday, marking tag, shipping tag. This was done on the basis of the number of orders of each of these classes which are handled annually. Approximately $5,100 of the total $23,400 applied to all stock orders was thus distributed to the box line, $6,100 to the crepe, $4,000 to the holiday, $5,400 to the marking tag, and $3,000 to the shipping tag line. Simple division of these expenses by the respective number of orders of each of these commodity groups resulted in a cost per order for registering each class.

Since a cost unit cannot be converted directly, however, into a merchandise cost, because usually there are several kinds of mer-

chandise called for on the same order, it was necessary to take the final step of converting the order costs into terms of cost per item filled. This was effected readily by dividing the order cost by the average number of items filled on each of the five classes of orders. It resulted, therefore, in a standard merchandise cost rate of .013, .016, .010, .014, and .008 per item for registering box, crepe, holiday, marking tag, and shipping tag orders, respectively.

The same procedure was followed in the case of the expenses incurred in the registering of special orders. A standard filling item cost by merchandise lines for these orders was obtained from the original distribution of the total cost on an order basis. The total result of the distribution, therefore, was the development of five individual merchandise cost units for stock and special goods which could be applied to the actual commodities sold.

Each expense was handled in identically the same fashion except that in different cases different bases for distributing the expense were used. With some, the allocation was made on the package basis, with others, on the customer-month basis, and with still others on the dollar of total expense basis. Always, however, the distribution of each expense resulted in a unit merchandise cost for each of the five broad classes of stock and special orders. A recapitulation and combination of these functional unit costs produced the final standard order-handling and order-filling rates—namely, a rate per filling item, a rate per unit or package, and a rate per cubic inch for each major class of stock and special merchandise.

## II. THE APPLICATION OF STANDARD SECONDARY COST RATES

The standard rates developed in the manner which has been described above are applied to each individual commodity sold in quite the same fashion as are factory costs. Cost cards for each merchandise item, bearing the standard quantity to the package, the cubic content of the package and the average number of units sold per sale, are prepared. On each are computed and figured from the commodity class rates the specific rate per item, per unit, and per thousand cubic inches with which to charge the commodity for order-handling and order-filling expense.

In order to obtain the total secondary cost of goods sold, it only

remains to add up the quantities of each kind of goods shipped during a given month and multiply the total quantity by the standard order-filling cost rates shown on each cost card for each item of merchandise. The total cost applied to all the individual commodities sold, therefore, gives the total amount of order-handling and filling expense absorbed. Although this appears to be a gigantic task, the work is not as laborious or as costly as it would seem to be at first sight. This arises from the fact that tabulating machine cards are punched for each item shipped, and sorted and tabulated by commodity class and quantity very quickly. The rest of the work consists only of a few hundred simple multiplications.

It can readily be seen wherein the value of such a development and use of standard order-handling and filling rates lies. In truth, having had them for several years, we could not now do without them. They enable us to know exactly what we are spending each year to handle and fill the thousands of orders that are secured by our selling organization. Just as in the case of factory costs, they provide the basis of controlling these order-handling expenses by bringing to view variations away from the standards established for these costs. They are invaluable for pricing purposes. By giving the cost of handling orders for each individual commodity, it is possible at once to determine more exactly the price that should be set to cover the expense incurred on them. It is also possible to uncover the cases in which the secondary costs are so high in relation to the price at which the goods are sold that intelligent decisions can be made concerning the specific lines that are unprofitable and hence to be discontinued. In short, they have precisely the same application and use as factory costs despite the fact that they are concerned with marketing rather than production expenses.

## III. ACCOUNTING PROCEDURE FOR RECORDING ORDER-FILLING COSTS

As has been previously been stated, this order handling and filling expense data has been gathered and summarized statistically for several years. Not until rather recently, however, has the attempt actually been made to incorporate it in the accounting records. The delay in doing this was occasioned by the desire to refine and test the methods employed in distributing secondary

costs before attempting to set up a formal procedure for recording them. The results of the application of these costs and a check-up of their reliability indicated that a step forward in this direction could justifiably be made. The possibilities were studied, and an accounting technique quite similar to the one which has been employed for our factory costs was adopted.

Briefly, the procedure involves an arrangement whereby all of the order-filling expense accounts of the office, warehouse and planning divisions appear on a separate ledger, known specifically as the Secondary Cost Ledger. For each of the order-handling and filling expenses, there is provided an account which is credited at the beginning of each month with the amount of the approved budget for these expenses. These approved budgets, it should specifically be noted, are selected with great care and presumably represent the specific amount of cost that should be incurred in handling and filling with normal efficiency the volume of business expected to be received. In this fashion, they represent the standard of performance to be attained, any difference between the amount of the budget credits and the actual monthly expenses indicating the effectiveness with which the order-filling functions were carried on.

In turn, the total amount entered as a credit to the various budget accounts is charged to an account on the ledger called the "Order Filling Cost Variation Account." It comprises the amount of order filling and order handling cost that should be absorbed by the commodities sold on the basis of expected volume of sales.

At the end of the month credits are entered to this variation account and charges made to a "Secondary Cost of Goods Sold" account for the actual amount of secondary cost that is chargeable at standard rates to the specific merchandise sold. These charges are based on the card and item count, made by our statistical section, of shipments of the various classes of goods to customers during the month. In this way, order handling costs are actually charged against sales and entered into the total cost of goods sold along with factory costs.

The balance in the "Secondary Cost Variation Account," which is the difference between the charges into this account from the order-filling expense budgets and the amounts credited to the account from the "Secondary Cost of Goods Sold Account," is

shown on the balance sheet as a profit and loss item. Presumably it represents the amount and nature of orders expected and those actually received. Strictly speaking, however, all of this variation should not be regarded as pure income or expense due to selling a greater or lesser number of items of merchandise than the quantity on which the order-filling rates were based originally. Some part at least will constitute the element of error that found its way into the standard order-filling rates at the time of their development.

In this way the three broad divisions of order-handling and order-filling expense charged at standard rates to the cost of goods sold, namely the costs of operating the office, warehousing and planning units, are shown on the company's books. At any time reference to the "Secondary Cost of Goods Sold Account" enables one to learn immediately the total amount of order-filling expense which has been applied to the commodities sold and which rightly should be regarded as a true element of merchandise cost. Furthermore, reference to the "Secondary Cost Variation Account" brings clearly to view the amount of order-handling and filling expense which is being under or over-absorbed as a result of fluctuations in the volume as well as the size and character of orders handled. Finally, and as a purely incidental feature, this accounting technique provides the basis for measuring actual performance against predetermined standards of operation for order-filling functions. In yielding all of these advantages, we are finding that it is becoming a tool of inestimable value for purposes of merchandising control.

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